INJURIES TO THE CENTRAL NERVOUS SYSTEM

Traumatic brain and spinal cord injuries tend to occur early in life and frequently are permanently disabling. Potential sequelae of these central nervous system (CNS) injuries include memory loss, inability to concentrate, speech problems, motor and sensory deficits, and behavioral problems. Varying degrees of dependency may result. In most other injuries the injured person eventually returns to normal activity levels, but CNS injury may cause large losses of years of productive life among those who survive. Therefore, any progress toward reducing brain and spinal injuries has extra benefits in comparison with prevention of most other injuries; prevention may reduce lifelong disability and dependency.

The data in this section describe the risk groups and the major causes of traumatic brain injury (TBI) and spinal cord injury (SCI) in New York State among persons admitted to a hospital, or who died, with those injuries. Cases included are those with any of the following International Classification of Disease (ICD) codes recorded as any of the nine diagnoses in the hospital discharge summaries, or as a cause of death in death certificates:

800.0 - 801.9	Fracture of the vault or base of skull
803.0 - 804.9	Other and unqualified and multiple fractures of skull
850.0 - 854.1	Intracranial injury, including concussion, contusion, laceration, and hemorrhage
806.0 - 806.9	Fracture of vertebral column with spinal cord injury
952.0 - 952.9	Spinal cord injury without evidence of spinal bone injury

These data describing incidence, i.e., the number and rate of **new** cases of CNS injury, are best estimates; incidence cases cannot be identified with certainty from New York State's Uniform Hospital Discharge (UHD) system. Because CNS injury patients commonly have multiple hospitalizations following a single injury event, double-counting can occur as there is no direct method for distinguishing a patient's first, acute

care, hospitalization due to an injury, from subsequent hospitalizations for sequelae of the same injury. Adjustment techniques to reduce double-counting are now under development, and new data elements added to the system in 1995 will allow more precise incidence estimates in the future.

Similarly, the mortality data reported in this section should be regarded as best estimates; some deaths due to CNS injury may have been coded as "multiple trauma", as one example of possible misclassification. Whereas the morbidity data probably overstate incidence, the mortality data may be an incomplete count.

The main source of the data presented here is New York's uniform hospital discharge reporting system, called SPARCS (Statewide Planning and Research Cooperative System), which originated in 1982. CNS injuries are identified from diagnoses recorded in patients' hospital charts and conveyed in code to SPARCS, using the International Classification of Diseases. The causes of those injuries are derived from the "E-codes" (external cause of injury codes), which were added to the SPARCS system in 1990.

The mortality data are generated using the Multiple Cause-of-Death Public Use Data Tapes from the National Center for Health Statistics, the only source which provides both the pathology (diagnosis) and the cause of the injury. As of this writing the most current available year of multiple cause of death data is 1989.

Accordingly, the following tables present mortality trends from 1982 through 1989, morbidity trends from 1982 through the most recent year of compiled SPARCS data, 1993, and etiology data from 1990 through 1993. The population used for calculation of incidence rates is the mean of the 1991 and 1992 population estimates prepared by the demography unit of the New York State Health Department's Bureau of Biometrics.

Readers should note that both brain and spinal injuries may occur simultaneously in the same event. Hence, a person in a car crash with multiple injuries may be included both in the brain injury and in the spinal cord injury statistics. In the four years for which injury cause is coded using E-codes, 1990-1993, there are 73,874 patients hospitalized with CNS injuries. There are 71,423 patients with TBI and 2,769 with SCI, a total of 74,192 incidents of CNS injury. Thus, there are 318 patients whose diagnosis codes indicate both a brain and a spinal injury.